

U.S. Patent Application
In re. Jonathan S. Till
Filed January 18, 2002
Attorney Docket No. 10551-317

What is claimed is:

1. A method for preventing and/or reversing presbyopia comprising applying localized energy to the area to be treated and administering a pharmaceutically sufficient quantity of a biologically acceptable chemical substance capable of breaking the chemical bonds such as disulfide bonds between the cortical lens fibers.
2. The method of claim 1, wherein said localized applied energy comprises treatment with at least one or more of heat, energy, sound or enzyme.
3. The method of claim 1, wherein said biologically acceptable chemical comprises glutathione, thiols and derivatives thereof.
4. A method for increasing the amplitude of accommodation of a human eye having a lens and a ciliary muscle comprising the step of administering a pharmaceutically sufficient quantity of a biologically acceptable reducing agent to affect a

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change in the elasticity of the human lens.

5. The method of claim 4, wherein the biologically acceptable reducing agent is selected from the group consisting of glutathione, thiols and derivatives thereof.
6. The method of claim 4, further comprising the step of treating the human eye with applied energy.
7. The method of claim 1, wherein reformation of disulfide bonds is prevented.
8. A method for treating and preventing presbyopia comprising breaking and/or preventing formation of disulfide bonds about the lens fibers to form sulfides and reducing them with either hydrogen or other agents.
9. The method of claim 8, further comprising

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catalyzing the reaction by applying energy.

10. The method of claim 8, wherein said disulfide bond breaking and/or preventing is catalyzed by agents selected from the group consisting of aldoreductase, glyoxylase, glutathione S-transferase, thiol reductase, tyrosine reductase or any biologically suitable compatible reductase.
11. A method for treating and/or preventing presbyopia comprising breaking disulfide bonds and reforming the sulfide bonds with -CH₃ or any other suitable molecule.
12. The method of claim 11, wherein said breaking and/or preventing disulfide bonds further comprises the applying energy.
13. The method of claim 11, wherein said breaking and/or preventing disulfide bonds further comprises applying enzyme capable of breaking the disulfide bonds..

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14. The method of claim 13, wherein said enzyme comprises S-methyl glutathione, S-Transferase.
15. The method of claim 11, wherein said breaking and/or preventing formation of disulfide bonds further comprises applying a chemical catalyst capable of promoting a catalytic reaction.
16. The method of claim 15, wherein said chemical catalyst comprises methyl-methane thiosulfonate and methyl glutathione.
17. A method for treating and/or preventing presbyopia comprising breaking interlenticular fiber adhesions and freeing the fibers to move relative to each other.
18. The method of claim 17, wherein said breaking and/or preventing interlenticular fiber adhesions further comprises applying energy.

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19. The method of claim 17, wherein said breaking and/or preventing the formation of interlenticular fiber adhesions further comprise applying enzyme capable of breaking and/or preventing said interlenticular fiber adhesions.
20. The method of claim 17, wherein said breaking and/or preventing interlenticular fiber adhesions further comprise applying a chemical catalyst capable of promoting a catalytic reaction.
21. A method for reversing and/or preventing presbyopia comprising applying localized energy to the area to be treated and administering a pharmaceutically sufficient quantity of a biologically acceptable chemical substance capable of breaking and/or preventing the formation of the chemical bonds between two sulfur groups of the cortical lens fibers.
22. An agent that prevents or reduces the likelihood of reformation of disulfide bonds.

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23. A pharmaceutical composition for treatment and/or preventing of presbyopia comprising thiol transferase, glutathione, nicotine adenine dinucleotide phosphate.
24. The pharmaceutical composition of claim 23, further comprising a biocompatible carrier.
25. The pharmaceutical composition of claim 23 encased in a viral phage.
26. The pharmaceutical composition of claim 24, wherein the composition is administered topically.
27. The pharmaceutical composition of claim 23 administered systematically.
28. The composition of claim 23, further comprising a photo reactive compound.

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29. The composition of claim 28, wherein the composition is activated by introduction of applied energy.
30. The composition of claim 23, wherein the thiol transferase is present in an amount of 0-20 wt%.
31. The composition of claim 23, wherein the glutathione is present in an amount of 0-20%.
32. The composition of claim 23, wherein nicotine adenine dinucleotide phosphate is present in an amount of 0-20%.
33. The composition of claim 23, wherein the glutathione is S-glutathione.